

OBSERVATIONS ON THE EUCALYPTS OF NEW
SOUTH WALES.

BY HENRY DEANE, M.A., F.L.S., &C., AND J. H. MAIDEN, F.L.S., &C.
(THE ILLUSTRATIONS BY R. T. BAKER, F.L.S.)

PART I.

(Plates LIV.-LVII.)

INTRODUCTORY.

The two great works on the genus *Eucalyptus* are the "Flora Australiensis," (Vol. iii. pp. 185-261); and Baron von Müller's Monograph "Eucalyptographia," a quarto, with illustrations of one hundred species.

For some years past we have been giving particular attention to those species which occur in New South Wales, and, as the result of our investigations, both in the field and from examination of specimens, dried or otherwise, we are in a position to submit some notes which we believe will usefully supplement the works above referred to. The subject is a vast one, and we hope to add to these notes on particular species from time to time. We hope to do for the Eucalypts of New South Wales what Howitt has done for those of Gippsland in his paper "The Eucalypts of Gippsland," (Trans. Roy. Soc. Vict., Vol. ii., Part 1, pp. 81-120).

We trust our facts and suggestions will be found useful as far as they go; they are obviously incomplete in many directions, but we trust that they will lead to the taking of additional observations, and the collection of additional material by botanists and others in every district of the Colony in which Eucalypts are found.

EUCALYPTUS STELLULATA, Sieb.

Introductory.—The name is rather happy, and refers to the disposition of the buds, which remind one of a little star or rosette.

Vernacular names.—“Black Sally,” Gippsland and Southern New South Wales at least as far north as Goulburn; also New England Ranges. “Black Gum,” Bombala.

The above names have been given on account of the rough, hard black bark on the butt.

“Sally Butt,” between Bathurst and Orange. The name “Sally,” without a qualifying adjective, is in use at Bombala, Boro, Braidwood and Yass. The name is in allusion to the species being often found on the banks of streams, like a sally (sallow or willow). “Olive-green Gum” (Leichhardt). “Green Gum,” County of Argyle and Blue Mountains (Macarthur; New England and high land near Braidwood (Dr. Woolls). “White Gum,” County of Argyle and Blue Mountains (A. Cunn.). “Blue Gum” (Forester Mecham, Tumut). “Lead Gum,” County of Argyle and Blue Mountains; Berrima (Macarthur); Hartley and Mudgee (Woolls).

All the above names, “Olive-green Gum,” &c., are attempts to describe the appearance of the smooth portion of the bark, which varies from white with a bluish or lead-coloured cast to even a dirty olive-green.

The species is a stunted gum growing at high elevations, smooth-barked (except at the butt), and looking as if it were blue or lead-coloured with the cold. There are so many White Gums that we think the name “Lead-coloured Gum” is a useful one, while “Black Sally” is better still, and the most widely spread of existing names.

It is called “Muzzle-wood” in Gippsland, but the meaning of the name is unknown to us.

Seedling or sucker leaves.—Ovate-acuminate, larger in size and thinner in texture than the mature leaves. The average dimensions of some seedling leaves in our possession are $3\frac{1}{2}$ inches long by a width of one half this. (Pl. liv., figs. 7-9.)

Mature leaves.—The tips are often hooked like those of *E. coriacea* and of some forms of other species, e.g., *amygdalina*. The leaves of both species when dry are smooth and usually show

black dots (like *E. punctata*), while the parenchymatous tissue is more or less channelled. These appearances are also seen in some forms of *E. amygdalina* and other species, and we draw attention to them in order that too great importance be not attached to them. In *E. punctata* these black dots were considered to indicate a specific difference.

The shape of the leaves is lanceolate to broadly lanceolate. The leaves are smaller than those of *E. coriacea*. The venation springs from the petiole, and the primary veins are prominent and roughly parallel to the midrib.

Timber.—Pale coloured, rarely free from gum-veins, warps seriously, a sound log of any size very rare; of little value for purposes other than fuel. Timber that shrinks much in drying may do so regularly or irregularly. Those of the first class have, when dry, practically the same shape as the original piece, but those of the second class take on irregular shapes. The timbers of *E. stellulata* and *E. coriacea* belong to the latter class.

Variations from type.—var. *ANGUSTIFOLIA*, Benth. (Syn. *E. microphylla*, A. Cunn. partly) with small, narrow leaves.

Highest parts of the Blue Mountains, *e.g.*, Blackheath and Mt. Victoria. Occurring with the ordinary form in the Kanimbla Valley. See fig. 8.

Range.—Typical form.—The tops of the ranges on the N.S.W.-Victorian border, thence following the Dividing Range and its spurs at least as far north as the New England Ranges, and as far west as 18 miles west of Bathurst, on the Silurian; also at Rylstone. We have specimens from these localities, but it may be reasonably expected to be found further north and further west, in mountainous districts.

EUCALYPTUS CORIACEA, A. Cunn.

Introductory.—This is the name given in the *Flora Australiensis*. Sieber's name *E. pauciflora* has doubtful priority, but it is so inappropriate (no Eucalypt flowering more freely than this), while Cunningham's name is remarkably appropriate, that we feel it our duty to adopt the name *E. coriacea* for this species.

Vernacular names.—One of the “White or Cabbage Gums,” but not to be confused with *E. hæmastoma*, var. *micrantha*, which goes by the same names. Its usual name with us is “White Gum,” though it is very frequently called “Cabbage Gum” also. The names “Flooded Gum” and “Peppermint” under which this species is known in Victoria (B. Fl.) would not appear to be in use in this colony. As regards the latter name, we suggest that it has arisen from the fact that a form of *E. amygdalina* growing in the south-eastern part of the colony resembles *E. coriacea* in fruits and perhaps in other respects. We have evidence pointing in this direction.

The species goes under the name of “Weeping Gum” in Tasmania, owing to its scrambling habit; the name is also in use at Uralla, N.S.W. At Glen Innes it is locally known as “Tumble-down Gum,” also by reason of its aspect.

“Glassy Gum” is a name in use at Guyra, on account of the vitreous appearance of the bark.

“White Sally” is a name in use at Queanbeyan.

Seedling leaves.—Broader than the mature leaves; more or less ovate.

Mature leaves.—Coriaceous, yet often succulent, and hence eaten by stock. They are comparatively large, six inches being a common length, while five inches is perhaps under the average. The width is usually about $1\frac{1}{2}$ inch. They are usually shiny, but in the coldest districts often glaucous. The venation is as stated under *stellulata*, and in this respect not only shows affinity with that species but also with *amygdalina*, particularly through the variety *latifolia* of that species.

Timber.—Pale coloured, full of gum veins; warps a good deal.

Variations from type.—Following are notes on Eucalypts which more or less depart from the typical form of *E. coriacea* :—

(a) *E. coriacea* becomes less glaucous in the Delegate district; bark scribbled like *E. hæmastoma*. The young leaves are larger and thinner than those of the type.

(b) Leaf about $4\frac{1}{2}$ inches long, straight or nearly so, *i.e.*, seldom falcate, fruit more nearly sessile. Unripe fruits nearly hemispherical; ripe fruits contracted at the orifice and ovoid. Sometimes glaucous, and apparently connecting with variety *alpina*. The bark is smooth, grey and striped, and is marked by scribbles similar to those of *E. hæmastoma*. The tree is in fact a good deal like that of a large-fruited variety of *E. hæmastoma*, to which we shall subsequently allude, but the venation and consistence of the leaves (not to mention other points) are those of *E. coriacea*.

Cooma District. Cooma and Braidwood Road.

(c) Var. *alpina*, F.v.M. (B. Fl. iii. 201). Leaves short and nearly straight. Flowers rather smaller and peduncles shorter.

Mountains on Macalister River, Vic. (B. Fl.).

Specimens of this variety from Mt. Kosciusko, in our own Colony, are very glaucous. Leaves 2 inches long, or a little more. (Pl. liv., figs. 2-3.)

Range.—Usually at fairly high elevations, preferring undulating, grassy country in the ranges and high table-lands. Found practically in the same districts as the preceding species.

E. AMYGDALINA, Labill.

The various forms have leaves which have a strong (sometimes very strong) odour of peppermint, to which circumstance they owe their commonest vernacular name. *E. piperita*, *E. sieberiana* and *E. stuartiana* possess an odour of a somewhat similar character. *E. piperita* and *E. stuartiana*, especially in certain districts, are known by the name of "peppermint," but *E. amygdalina* is the tree which is most usually understood by that name.

We propose to classify the various New South Wales forms we deal with on the present occasion as follows:—

Sucker or seedling leaves narrow.

1. The typical species, comprising a number of forms which do not, at first sight, appear to be connected with each other.

2. Var. *radiata*, containing the tree usually known as "River White Gum."

Sucker or seedling leaves broadish.

3. Variety *latifolia* (*nobis*), comprising some of the broad-leaved forms.

There are other forms, at present placed under *amygdalina*, but as our specimens or observations in regard to them are incomplete, we prefer to postpone consideration of them.

1. Typical *E. amygdalina*.

Introductory.—In the case of such a protean species as *E. amygdalina*, it may be useful, and it is certainly interesting, to note what the definition of the species really was, as by different authors the description has been modified very considerably.

The original specimen described by Labillardière came from Tasmania. The following is Don's translation of the species description given in DC. Prod. iii. 219 :—

"Lid hemispherical, nearly mutic, shorter than the cup; peduncles axillary and lateral, nearly terete, length of the petioles; umbels 6-8 flowered, nearly capitate; leaves linear-lanceolate, attenuated at the base, and acuminate mucronate at the apex. Leaves 3 inches long, and 3 lines broad, some unequal at the base, and some equal. Petioles and peduncles 3 lines long. Fruit globose, size of a grain of pepper."

Vernacular names.—Peppermint or Messmate are the most widely used names, and they are perhaps indiscriminately employed. Perhaps the former name is more prevalent as far north as Mittagong and the Blue Mountains, and the latter in New England, but the two names are often employed in the same district for the same tree. Some other local names will be found under *Range*.

Bark.—This is the least variable characteristic; it is sub-fibrous, although on the one hand it sometimes approaches the character of a Stringybark, on the other hand it is often of a

shorter character, resembling the more friable varieties (of barks) of *E. hemiphloia*. It is almost undistinguishable from the bark of *E. piperita*. It is usually of a dark, dirty grey colour. Occurs only on the trunk, or at most on the largest branches; the branches usually quite smooth.

Seedling or sucker leaves.—Opposite, narrow-lanceolate. Probably all the forms have the twigs more or less rusty glandular.

Mature leaves.—This species varies in the size, shape and texture of its leaves. The usual shape is lanceolate, or even broadly-lanceolate, but some forms are linear-lanceolate or even nearly linear, comparatively thick, and the veins very oblique at the base, not prominent, *e.g.*, specimens from Mittagong, and also a tree known as “Silver-top” at Nimitybelle in the extreme south of the Colony. Sometimes the foliage is quite dense; in other cases it is sparse.

This would appear to be the form most generally employed in the manufacture of Eucalyptus oil in this Colony. It is so chosen because its leaves contain an unusually large percentage of oil, which is, however, not at present a favourite in European markets owing to the almost entire absence of cineol (eucalyptol) and the very large percentage of phellandrene. The above remarks are more or less applicable to all forms of *amygdalina*.

Buds —The shape of the operculum of the western and northern forms (Mt. Victoria and New England) is blunt, being nearly hemispherical; those of the southern forms in our collection are more pointed.

The variability in the shapes of the operculum in *E. amygdalina* is brought out in the plate (comprising two forms) in the “Eucalyptographia.”

Fruits.—Although in the original description of the species the flowers are in heads of 6-8, those of some of our N.S.W. forms have at least twice as many, and some perhaps nearly as many as those of the variety *radiata*. None of our specimens have the fruits as pear-shaped as depicted in the drawing of the left-hand

specimen of *E. amygdalina* in the "Eucalyptographia." (See var. *latifolia*). Following is a general description of them:—

The fruits are of a pilular shape, though with some slight tendency to pear-shape. They are wide at the mouth and almost hemispherical, somewhat in the manner of *E. acmenoides*. Bentham's "sub-globose truncate" applies to many of the forms.

The tips of the valves are sometimes slightly exerted.

Timber.—Pale-coloured (nearly white) when newly cut, but drying to a pale brown. Often liable to gum veins, which tend to form thin concentric rings. Of inferior durability and strength as a very general rule, but we have some apparently well authenticated instances of the durability of this timber for posts and shingles in the New England District.

Range.—Extending from Victoria along the various coast mountain ranges and their spurs at least as far north as New England, and westerly as far as the western slopes of the Blue Mountains.

Some specific localities in this Colony may be stated as follows:—Mountain Top, near Nimitybelle (Silver Top). Braidwood District. Goulburn District generally. At Marulan, Eucalyptus oil is distilled from this form (Peppermint). Kangaloon (White-topped Mountain Ash). Hill Top and Mittagong. Mt. Wilson. Mt. Victoria (Narrow-leaved Peppermint). New England (Messmate). The specimens from the last two localities are to all intents and purposes identical.

2. Var. *radiata* ("River White Gum").

Introductory.—We have a fairly distinct tree which goes under the names of "White Gum," "River Gum," "River White Gum," "Ribbon Gum," and even "Narrow-leaved Peppermint."

Its favourite habitat is on the sides of gullies, or on the steep banks of rivers, often some distance from the bed of the river or creek, but usually (perhaps always) on a well-drained slope leading to a water-course. We have not observed the tree out of gullies.

It is often seen as a graceful sapling, but may attain the dignity of a large tree; in this Colony we have it up to 3 feet in diameter with a height of over 150 feet.

It has rather sparse, drooping foliage, which gives it, at times, something of a willow-like aspect.

Bark.—The appearance of the bark of this tree is worthy of careful record, to save confusion. It is nearly a White Gum when very young, but afterwards the bark of the upper part falls off in thin, long ribbons (hence the name Ribbon Gum), and the lower part of the trunk becomes covered, to a varying height, with fibrous bark of the character known to many as Peppermint bark.

We have not observed a tree of this variety falling strictly within the definition of White Gum, like *E. hæmastoma*, for instance; it is *nearly* a White Gum.

Sometimes, as observed near Mittagong, the lower part of the trunk of the River White Gum is of a thin scaly appearance; in trees say 12 inches in diameter, this scaliness would extend to 10 or 12 feet from the ground. This scaly appearance, which is not easy to describe, is intermediate in character between the scabrous bark of a Grey Gum (*E. punctata* or *propinqua*), and the thick scaly bark of a Bloodwood (*E. corymbosa*). As these trees increase in size, the scaliness changes into that of a hard, fibrous “peppermint-like bark” character. The branches are quite smooth.

We draw attention to this matter, as two observers might possibly obtain two series of herbarium specimens agreeing in the minutest particulars, and one observer might report his tree smooth-barked (*Leiphloia*), and the other half-barked (*Hemiphloia*).

The name given by the aborigines of the County of Cumberland, N.S.W., to the “River White Gum” used to be “Kayer-ro,” according to the late Sir William Macarthur. This accurate observer writes of it—“Of no value for timber. A small, quick-growing species, very elegant when in blossom; is found only on the immediate sandy banks of rivers; the inner bark used for tying

grafts and for other similar common purposes." Subsequently Mr. Howitt points out that the aborigines of Gippsland similarly used the bark for tying and lashing, hence their name for the tree, "Wang-gnara," which signifies "bark-string."

Vernacular names.—Already dealt with.

Bark.—Already dealt with.

Seedling or sucker leaves.—The young stems have a rusty, glandular appearance, and the leaves are very narrow.

Mature leaves.—Dealt with below. (See page 607).

Although the leaves of this form are very thin, specimens from Bateman's Bay to Wagonga are especially thin. These specimens also have unusually narrow leaves.

Buds.—See page 607.

Fruits.—Large numbers (commonly 20 and more) in an umbel, borne on rather long, often filiform pedicels. They have a very regular, radiate appearance. Mostly pale coloured when dry. Very uniform in size, 2 to $2\frac{1}{2}$ lines (barely) in diameter, and pilular in shape. Sometimes they tend to close at the orifice.

Timber.—It is a white, fissile timber, rather tough when freshly cut, but afterwards of inferior strength. It is easily worked, but not durable on exposure. It is sometimes, we believe, fraudulently or ignorantly substituted for "Mountain Gum" (*E. goniocalyx*) in the Braidwood District, with disastrous consequences to the durability of the work in which it is used, and to the reputation of that undoubtedly valuable timber.

Range.—From Gippsland, through New South Wales, throughout the southern districts, at least as far north as the banks of the Nepean in the latitude of Sydney. Subsequent inquiry will probably find that it occurs further north. It is fond of valleys; we have it from such localities as Kangaroo Valley (between Moss Vale and the coast), and from Hartley Vale (near Mount Victoria). Our specimens from the Deua (Moruya) River and Tantawanglo Mountain connect with the Gippsland ones.

Botanical position.—Having described this Gum with some detail, we now proceed to enquire into its botanical position. There is no doubt that this “River White Gum,” Bentham’s variety *radiata* of *amygdalina* (B. Fl. iii. 203), and Howitt’s form (*e*)* of *E. amygdalina* all come more or less satisfactorily under Sieber’s *E. radiata*. A good deal of confusion has occasionally arisen in regard to the reading of Sieber’s description. We give Don’s translation of the original Latin in DC. Prod. iii. 218, Howitt’s description of the Gippsland form, and Bentham’s definition of var. *radiata*.

“*E. RADIATA*, Sieb.

“Lid of calyx hemispherical, mucronate, shorter than the cupula; peduncles axillary and lateral, rather angular, and rather shorter than the petioles; flowers 15-20 together in an umbel, on short pedicels; leaves linear-lanceolate, veins very fine, confluent at the apex, and forming a nerve, which is parallel with the margin.

“Fruit globose, 3 lines in diameter. Petioles 4 lines long. Leaves 4 inches long and 6-7 lines broad.”

Mr. Howitt describes his form (*e*) as having:—*Leaves* narrow lanceolar falcate, attenuate at the stalk and pointed. Venation rather indistinct, the marginal vein considerably removed, and the lateral veins very longitudinal. *Umbels* on stalks as long or longer than the bud, the lid small and depressed, with a slight point. Buds numerous, 3 to 20. *Fruit* ovate-truncate, with slightly contracted orifice, compressed rather narrow rim, and small weak valves.

As described in the “Flora Australiensis,” iii. 203, the “variety” *radiata* has leaves rather broader (than the type), 3 to 4 inches long. Flowers usually more numerous, sometimes nearly 20 in the umbels. Fruit almost pear-shaped.

E. radiata, Sieb.—*Leaves* linear-lanceolate, 4" long, 6-7" broad, veins very fine, confluent at apex, forming a nerve, which is

* “The Eucalypts of Gippsland.” Trans. Roy. Soc. Vic. Vol. ii. Pt. i. p. 86, and Plate 10, figs. 1-5.

parallel with the margin. *Pedicles* short. *Buds*: lid hemispherical, mucronate. *Fruit* globose, 3 lines in diameter.

Bentham's variety *radiata* of *E. amygdalina*.—*Leaves* rather broader than type, 3"-4" long. *Fruit* almost pear-shaped.

Howitt's form (*e*) of *E. amygdalina*.—*Leaves* narrow-lanceolar, falcate. Venation rather indistinct. Marginal vein considerably removed. Lateral veins very longitudinal. *Pedicles* as long or longer than the bud. *Buds*: lid small and depressed, with a slight point. *Fruit* ovate-truncate, with slightly contracted orifice, compressed rather narrow rim, and small weak valves. (See his figure, *op. cit.*).

The "River White Gum" of N.S.W.—*Leaves*. The preceding (Howitt's) description applies very well. *Very* thin leaves. *Pedicles* rather long, often filiform. *Buds* nearly hemispherical; Howitt's description applies fairly well to this form. *Fruit* pilular (globose), very uniform in size ($2-2\frac{1}{4}$ lines in diameter), sometimes tending to close at the orifice. (Pl. lvi., fig. 3.) Often pale-coloured when dry.

Above is a comparative statement showing partial and condensed descriptions of *E. radiata*, Sieb., Bentham's variety *radiata*, Howitt's form (*e*) (both of *amygdalina*), and River White Gum.

Sieber gives the breadth of the leaves at from 6-7 lines. Most are of about that breadth, others go up to 9 lines, while we have specimens from the Deua (Moruya) River which has leaves with the exceptional width of $1\frac{1}{8}$ inches (nearly 14 lines!). Sieber gives the length of the leaves at 4 inches. These are too short as far as our River White Gum is concerned, leaves of 6 and 7 inches being common, while those of 5 inches at least are average ones. Sieber says pedicels *short*; those of the River White Gum are filiform and more than ordinarily long. He further gives the diameter of the fruit as 3 lines; we have never known it in the River White Gum to be quite $2\frac{1}{2}$ lines, really a difference of some importance when we note how marked a difference in the appearance of a small fruit half a line or more in diameter makes. Nevertheless, after careful consideration of the matter, and examination of a large number of specimens, we are of opinion that Sieber's original *radiata* was taken from a River White Gum.

Then coming to Bentham's brief definition of variety *radiata*, he states that the "leaves are rather broader than type." He has probably followed in part Hooker ("Flora of Tasmania," p. 137) in his description of *E. radiata* :—"Leaves . . . rather small, usually 3 inches long . . . narrow, sometimes very much so, though not so narrow as *E. amygdalina* usually has them." We have already shown what is the average length of the leaves of the River White Gum. As regards the breadth, the leaves of the River White Gum are usually narrower (not broader) than those of typical N.S.W. forms of *amygdalina*. As regards the fruits, Bentham's variety is "almost pear-shaped." Here again Hooker is probably followed. The latter states fruits "turbinate or obconic, rather large." Neither in size nor shape does this correctly describe our River White Gum. As showing the difficulty of dealing with *E. radiata*, we may point out that (doubtfully) Hooker (*op. cit.*) quotes five forms of it in Tasmania alone. We would like to observe that Sieber's original specimen of *E. radiata* came from N.S.W., and not from Tasmania, and it would be well to modify Bentham's brief description in the directions we have indicated, and not to follow a description of the variety made from Tasmanian forms.

We have proved that our River White Gum does not entirely agree with Sieber's *E. radiata* nor with Bentham's var. *radiata*, and our tree is so well marked that had we decided that it was expedient to recommend the restoration of *E. radiata*, Sieb., to specific rank, we should probably have defined our River White Gum as a variety of the same. In that case, we might have called it *filiformis* in allusion to the pedicels.

But after careful consideration we have decided to continue the River White Gum as a variety of *amygdalina*, though not without doubt. Close affinity between the type and var. *radiata* is shown by the seedling or sucker leaves; the type species approaches it sometimes in buds, mature foliage and even fruits, while we have shown the River White Gum sometimes to have rough bark. We may, perhaps, at some future time re-open the question.

3. Var. *latifolia*, nobis.

3. Leaves on suckers opposite, *broad*.

Introductory.—This variety has broad, mature leaves also, as will be seen presently. We have decided to name it *latifolia* for the sake of precision. It has much in common with Howitt's var. (b) (*op. cit.*), and may prove to be so similar that it may be desirable to associate them under the same variety.

Vernacular names.—It is usually known as "Peppermint" throughout its range. It is called "Blue Peppermint" at Rylstone, "Messmate" in the Tumut, Wagga Wagga and Braidwood Districts, while we have received specimens from a small tree at Bungendore under the name of "Box Gum."

Bark.—Rough like a typical Peppermint.

Seedling or sucker leaves.—Comparatively broad; stem-clasping, more or less cordate at the base, and in some cases quite acuminate. The shape is brought out in the figure.

Mature leaves.—Broader and thicker than the preceding. An important characteristic is the strongly marked venation. On drying, the principal veins stand out in relief against the vascular tissue. Often shining, a characteristic best brought out in fully mature leaves.

The leaves of the "Blue Peppermint" (so called on account of their glaucous cast), from Mt. Vincent are not shining, neither are those from the "Messmate" or "Peppermint" from Delegate and the Snowy River. The leaves of the broad-leaved form of *E. amygdalina* from some other localities are nearly as dull in appearance. Dried specimens of leaves from the Delegate District are covered prominently with blackish dots, and the tissue of the leaf is channelled. The tips of the leaves are also sometimes hooked, all these points showing some affinity between this form and *E. stellulata* and *E. coriacea*, a subject touched upon under *Fruits*.

Up to 5 or 6 inches is a common length for the leaves, but they are barely 3 inches in some of the Bombala and Queanbeyan

specimens from ill-developed (?) trees; $4\frac{1}{2}$ inches would appear to be an average length.

Specimens up to nearly 2 inches in width are found in the Mt. Vincent specimens; $1\frac{1}{2}$ inch is a common width; $1-1\frac{1}{2}$ inch may be given as the average width.

Buds.—Operculum usually blunt, though not quite hemispherical. Sometimes glaucous, as in the Wagga Wagga and Bell's Creek specimens.

Fruits.—With a greater tendency to pear-shape than any of the preceding, and the rim to be domed or arched (Pl. lvii., figs. 4-8). Usually shining. The tips of the valves occasionally a little exerted. The rims (mouths) usually red, a characteristic often attributed to *hæmastoma*, and the fruit itself often pale-coloured.

The fruits from Bell's Creek, and from Mt. Vincent, Upper Williams River, Cobark, and other high lands to the south of New England are sometimes more truncate than usual, but the arched or domed rim can always be traced in specimens from the same tree. Fruits from Bombala and Wagga Wagga are small, and have much the shape of those of *E. eugenoides*, but they are distinctly "domed."

There is a tree ("Messmate" or "Peppermint") of which we have herbarium specimens from Delegate and the Snowy River which has shiny, comparatively thick fleshy fruits which strikingly resemble *E. coriacea* fruits in miniature. From examination of fruits alone (or even perhaps of imperfect specimens of leaves which when mature are comparatively thick), an observer might readily name the tree *E. coriacea*, and we have suggested this as an explanation of "Peppermint" being given in the "Flora Australiensis" as one of the names for *E. coriacea*. The tree now under reference has the usual fibrous bark on the stem as ordinarily observed in *E. amygdalina*.

E. amygdalina and *E. coriacea* (not to speak of other species) are closely related species, and we express the opinion that they are perhaps most obviously related through the fruits and the leaves of our variety *latifolia* of the former species.

Timber.—The description of the timber of the typical form applies very well here.

Range.—The Dividing Range and its spurs from the Victorian border north and north-west at least as far as Byng in the Orange District, and Mt. Vincent (in the Rylstone-Mudgee District), also Cobark, Upper Williams River, and other places just south of New England.

Like other forms of *amygdalina*, much observation is still required in regard to its geographical distribution.

Specific localities are as follows:—Rob Roy; Delegate and the Snowy River; Tumut; Adelong; Wagga Wagga; Bombala (Quiedong); Queanbeyan; Braidwood; Bungendore; Mt. Vincent (watershed between Capertee and Turon); Byng; high lands, Upper Williams River; Cobark (near Mount Royal Range).

REFERENCE TO PLATES.

Plate LIV.

E. coriacea.

Fig. 1.—Normal leaf.

Fig. 2.—An average leaf of var. *alpina* (Mt. Kosciusko).

Fig. 3.—Another leaf of var. *alpina* (Mt. Kosciusko).

Figs. 4, 5, 6.—Fruits of *E. coriacea*, showing variation (4, from Cooma; 5, from Southern N.S.W.; 6, from Dubbo District).

E. stellulata.

Fig. 7.—A seedling leaf (from Quiedong, near Bombala).

Fig. 8.—Leaf of var. *microphylla* (from Mt. Victoria, Blue Mountains).

Fig. 9.—Cluster of fruits (from Kanimbla Valley, Blue Mountains).

Plate LV.

E. amygdalina (*typica*).

Figs. 1 and 2.—Twig and cluster of fruits from New England.

Fig. 3.—Seedling leaves.

Fig. 4.—Twig, with fruits.

Nos. 3 and 4 from Hill Top, near Mittagong. The leaves are comparatively small, narrow and coriaceous.

Plate LVI.

E. amygdalina (radiata).

Fig. 1.—Seedling leaves.

Fig. 2.—Specimens of mature leaves.

Fig. 3.—Cluster of fruits.

All from Hill Top, near Mittagong.

Plate LVII.

E. amygdalina (latifolia).

Fig. 1.—Seedling leaves.

Fig. 2.—Leaf of Blue Peppermint from Mt. Vincent, Ilford, near Mudgee.

Fig. 3.—Leaf from Tumut District.

Figs. 4-8.—Fruits, showing variation in arching of rim and general contour of fruit. No. 4 from Bell's Creek, Braidwood District; No. 5 from Cobark; No. 6 from Cobark, Nos. 5 and 6 from same twig, No. 7 from Mt. Vincent (Blue Peppermint); No. 8 from Tumut District.